

CLAIMS

What we claim is:

1 1. A method for determining which key value in a set of key values is to be assigned
2 as a current key value as a result an object intersecting a region where a virtual interface
3 for enabling selection of individual key values in the set of key values is provided, the
4 method comprising:

5 determining a position of where the object intersects the region using, at least in
6 part, a depth sensor that determines a depth of the position in relation to a position of the
7 depth sensor;

8 identifying a set of one or more historical key values that are pertinent to the
9 current key value;

10 determining at least one of (i) a displacement characteristic of the object or (ii) a
11 shape characteristic of object; and

12 indicating a probability that the current key value is a particular one or more of the
13 key values in the set of key values based on the position, the set of one or more historical
14 key values, and the at least one of the displacement characteristic or the shape
15 characteristic.

1 2. The method of claim 1, wherein the step of indicating a probability that the
2 current key value is a particular one or more of the key values in the set of key values
3 includes indicating, for each particular key value in the set of key values, that the
4 particular key value is the current key value.

1 3. The method of claim 2, wherein the step of indicating a probability that the
2 current key value is a particular one or more of the key values in the set of key values
3 includes providing an external electronic device with data corresponding to the likelihood
4 that each key value in the set of key values is the current key value.

1 4. The method of claim 1, further comprising the step of providing the virtual

2 interface by providing a light-generated keyboard over a surface, and monitoring a
3 portion of the surface where the light-generated keyboard is provided in order to detect
4 contact between any object and the surface.

1 5. The method of claim 4, wherein the step of identifying a set of one or more
2 historical key values includes using one or more key values that were indicated as being
3 the current value in one or more previous instances.

1 6. The method of claim 1, further comprising the step of detecting that the object has
2 intersected the region, and wherein the step of determining a position includes
3 determining that the position of the object is near or on a boundary of one or more
4 designated area in the region, wherein each designated area delineates one of the key
5 values in the set of key values.

1 7. The method of claim 1, wherein determining a displacement characteristic
2 includes determining a displacement of the object in relation to a surface of the region
3 where the virtual interface is provided.

1 8. The method of claim 5, wherein the step of using one or more key values that
2 were indicated as being the current value in one or more previous instances includes
3 using alphabet characters from the keyboard that were indicated as being the current key
4 values in the one or more previous instances.

1 9. The method of claim 1, wherein the step of using alphabet characters includes
2 using lexicographic information.

1 10. The method of claim 1, wherein the step of determining the shape characteristic
2 includes determining whether a shape of the object corresponds to any one of a stylus or a
3 finger.

1 11. The method of claim 10, wherein the step of determining the shape characteristic
2 includes determining whether a shape of the object corresponds to any one of a stylus tip,

3 finger tip, or unknown shape.

1 12. An electronic device for providing a virtual interface, the electronic device
2 comprising:

3 a position sensor configured to determine a position of an object that has
4 intersected a region where the virtual interface is provided, where the position includes at
5 least one coordinate that is based on a depth of the object from the sensor; and

6 a processor configured to:

7 identify a set of one or more historical key values that are pertinent to the
8 current key value;

9 determine at least one of (i) a displacement characteristic of the object or
10 (ii) a shape characteristic of object; and

11 indicate a probability that the current key value is a particular one or more
12 of the key values in the set of key values based on the position, the set of one or
13 more historical key values, and the at least one of the displacement characteristic
14 or the shape characteristic.

1 13. The electronic device of claim 12, wherein the processor is configured indicate, to
2 for each particular key value in the set of key values, that the particular key value is the
3 current key value.

1 14. The electronic device of claim 12, wherein the processor is configured to provide
2 an external electronic device with data corresponding to the likelihood that each key
3 value in the set of key values is the current key value.

1 15. The electronic device of claim 12, further comprising a light-source configured to
2 project a light-generated keyboard over a surface, and wherein the position sensor is
3 configured to monitor a portion of the surface where the light-generated keyboard is
4 provided in order to detect contact between any object and the surface.

1 16. A method for providing feedback as to an input selected by a user through an
2 input interface, the method comprising:
3 detecting that an object intersects an area where the input interface is provided;
4 determining a position of the object when the object intersects the area;
5 identifying a set of one or more possible input selections corresponding to the
6 contact based at least in part on the position, including at least a first input selection in the
7 set that is identified as corresponding to the contact between the object and the surface;
8 determining a probability indication for at least the first input selection;
9 generating a first sound to indicate that the probability indication for at least the
10 first input selection is below a threshold level, the probability indication indicating that
11 the identification of at least the first input selection is ambiguous.

1 17. The method of claim 16, further comprising the step of determining a second
2 position of the object when the object intersects the area a second time, and generating a
3 second sound to indicate that the probability indication for at least the second input
4 selection is below the threshold level.

1 18. The method of claim 17, wherein the first sound and the second sound have a
2 similar harmonic.

1 19. The method of claim 17, wherein determining a probability indication for at least
2 the first input includes determining at least one of (i) a displacement characteristic of the
3 object or (ii) a shape characteristic of object.

1 20. The method of claim 17, wherein determining a shape characteristic of object
2 includes distinguishing the object as being one of a stylus, a finger, or something else.